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WASTEWATER DISCHARGES INTO PENSACOLA BAY, ESCAMBIA BAY AND RIVER (EXCLUDING MONSANTO, AMERICAN CYANAMID AND AIR PRODUCTS)

J. S. Hall

Environmental Protection Agency
Athens, Georgia

May 1972

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REPORT TO THE CONFEREES OF THE THIRD SESSION OF THE CONFERENCE IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE ESCAMBIA RIVER BASIN (ALABAMA-FLORIDA) AND THE INTRASTATE PORTIONS OF THE ESCAMBIA BASIN WITHIN THE STATE OF FLORIDA

WASTEWATER DISCHARGES INTO PENSACOLA BAY, ESCAMBIA BAY AND RIVER

(EXCLUDING - MONSANTO, AMERICAN CYANAMID AND AIR PRODUCTS)

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May, 1972

Environmental Protection Agency
Surveillance and Analysis Division
Athens, Georgia

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The planning and operation of this project was carried out under the supervision of Mr. B. H. Adams, Chief, Engineering Services Branch.

Mr. J. S. Hall was project engineer and principal author of this report.

All Environmental Protection Agency personnel are assigned to the Surveillance and Analysis Division located at Athens, Georgia. The Division is under the direction of Mr. J. A. Little.

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INTRODUCTION

The purpose of this study was to document wastewater disposal practices in the Pensacola area. This report discusses each of the municipal and industrial wastewater sources (except Monsanto, American Cyanamid, Container Corporation, and Air Products) discharging into Escambia Bay, Pensacola Bay, or tributaries thereof. Field investigations were conducted during March 6-14, 1972, by the Environmental Protection Agency, Region IV, Surveillance and Analysis Division. The study was requested by the conferees at the January 1972 session of the Federal-State Enforcement Conference on Pollution of Escambia River and Bay.

Study objectives included:

- Documentation and/or characterization and quantification of all wastewater sources discharging either directly or indirectly into the receiving waters of Escambia or Pensacola Bays, and
- Recommendations for the abatement of pollution problems observed.

Appreciation is extended to the Florida Department of Pollution Control for providing preliminary planning assistance and field laboratory space. The cooperation and contribution provided by the numerous municipal and industrial entities investigated is also gratefully appreciated.

FINDINGS

A review of the Florida Department of Pollution Control files and on site investigations of industrial and municipal waste treatment plants showed the following:

1. Most industrial wastewater discharged into surface waters in the Pensacola area, excluding discharges from Monsanto, Air Products, and American Cyanamid, receive treatment at a municipal wastewater treatment plant. Armstrong Cork, Tenneco, and Ashland Chemical formerly discharged into Bayou Chico but now are pumped to Pensacola's main wastewater treatment plant.
2. Wood preserving companies -- American Creosote and Escambia Treating Company in Pensacola and T. R. Miller in East Brewton, Alabama -- discharge no process wastewater.
3. The following municipal and Federal wastewater treatment plants sampled, provided secondary (aeration or trickling filter) treatment:

Plant Name	Waste Flow	Receiving Waters
Pensacola Main Street	7.0 mgd	Pensacola Bay
Pensacola Northeast	0.5 mgd	Escambia Bay
Milton, Florida	1.0 mgd	Blackwater River
Pen Haven	0.8 mgd	Jackson Branch -- tributary to Bayou Chico
U.S. Naval Air Station	1.6 mgd	Pensacola Bay
Warrington	0.1 mgd	Jones Swamp Creek --
Moreno Courts	0.2 mgd	tributary to Bayou
Corry Field (U.S. Navy)	0.2 mgd	Chico

4. Pensacola's Main Street Wastewater Treatment Plant is approaching design capacity and the city has proposed to increase the capacity to 25 mgd.

5. The Naval Air Station which previously discharged industrial and domestic wastes through several outfalls now provides secondary treatment for all wastes and discharges them through one submerged outfall into Pensacola Bay.

6. At the time of the study, the city was considering abandoning the Pensacola Northeast Wastewater Treatment Plant and pumping the wastes to the Main Street plant.

7. Boise Cascade Corporation's process wastes are collected in two concrete holding tanks for periodic removal by a septic tank cleaning service. An insignificant waste load contained in cooling water and surface runoff is discharged.

RECOMMENDATIONS

1. The City of Pensacola should initiate plans as soon as possible for either expansion of the existing Main Street Wastewater Treatment Plant or construction of a new more centrally located facility.

2. The City of Pensacola should either abandon the Northeast Wastewater Treatment Plant and pump wastes to the Main Street plant or expand the plant and include advanced waste treatment.

3. Discharges from Corry Field, Warrington, Pen Haven, and Moreno Courts wastewater treatment plants should be pumped to the Pensacola Main Street Plant.

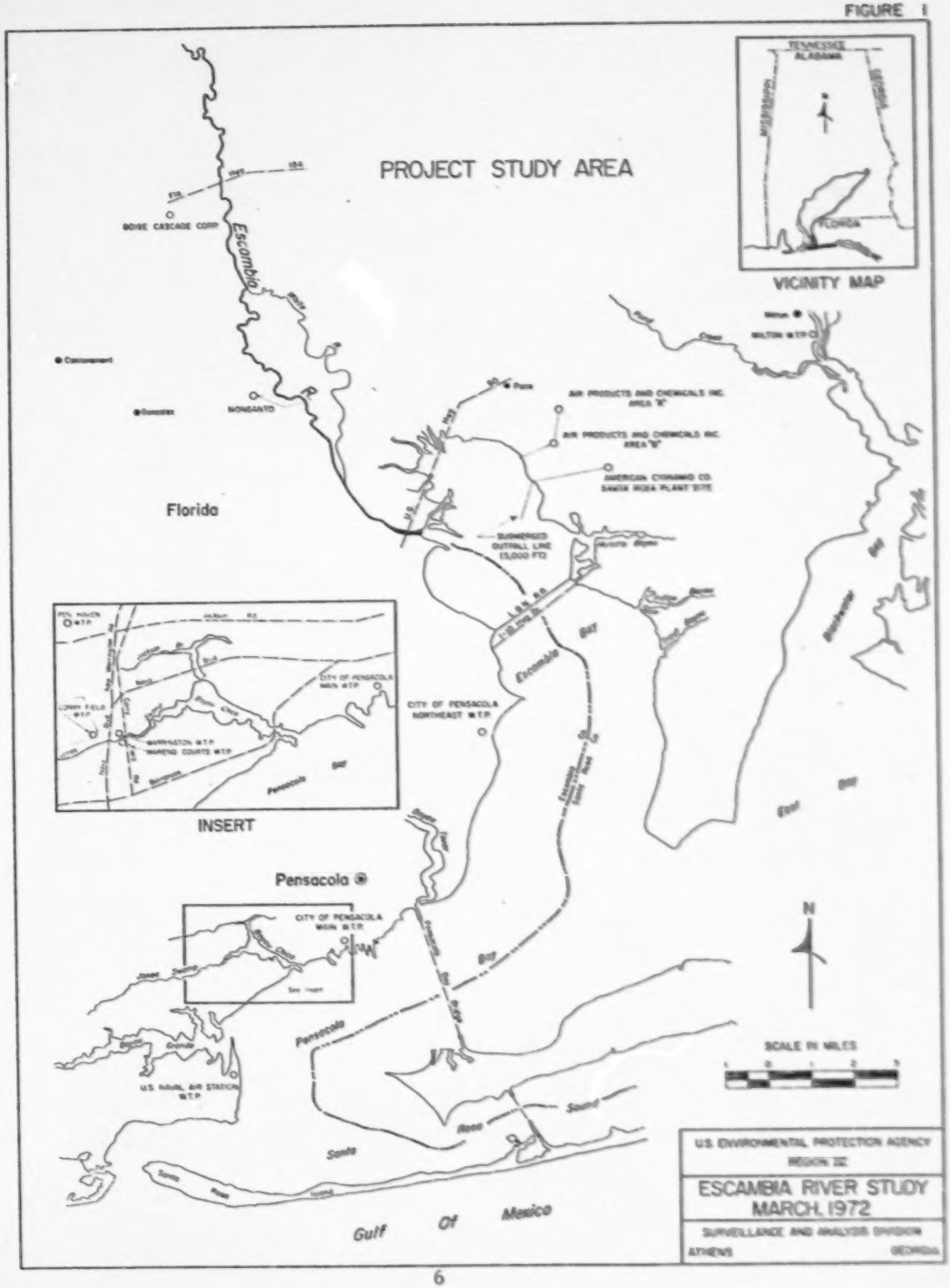
DISCUSSION OF WASTEWATER SOURCE INVESTIGATIONS AND SAMPLING RESULTS

SCOPE OF STUDY

The study area includes only those point sources of wastewaters discharged into surface waters in the immediate vicinity of Escambia Bay, Pensacola Bay, and into the Conecuh-Escambia River as far north as Brewton, Alabama (Figure 1). Excluded from the investigative work are discharges by Air Products, American Cyanamid, Monsanto, and Container Corporation. Wastewaters discharged from these industries are discussed in separate EPA reports (2, 3, 4, 5). Wastewater sources investigated include those discharges which may be contributing to the pollution of Escambia Bay.

Tidal current patterns and exchanges play an important role in Escambia Bay water quality; therefore, it is necessary to examine the wastewater and freshwater discharged into the entire Pensacola Bay system as well as those direct Escambia Bay and tributary discharges. The exchange of water between Pensacola Bay and Escambia Bay is restricted by the configuration of the entrance to Pensacola Bay. Freshwater flows into Escambia and Pensacola Bays from inland drainage via the Coneuch-Escambia, Blackwater, Yellow and East Bay Rivers. These drainage basins total approximately 6,480 square miles with about 64 percent (4,132 square miles) of the total area lying within the Conecuh-Escambia River Basin. Approximately 3,820 square miles of the Conecuh-Escambia River Basin are in Alabama.

FIGURE 1


PROJECT STUDY AREA
VICINITY MAP
TENNESSEE
ALABAMA
GEORGIA
MISSISSIPPI
FLORIDA
BOISE CASCADE CORP
Escambia River
Florida
MONSANTO
AIR PRODUCTS AND CHEMICALS INC. AREA "A"
AIR PRODUCTS AND CHEMICALS INC. AREA "B"
AMERICAN CYANAMID CO. SANTA ROSA PLANT SITE
SUBMERGED OUTFALL LINE (5,000 FT.)
CITY OF PENSACOLA NORTHEAST W.T.P.
INSERT
Pensacola
CITY OF PENSACOLA MAIN W.T.P.
U.S. NAVAL AIR STATION W.T.P.
Escambia Bay
Pensacola Bay
Santa Rosa Sound
Gulf Of Mexico
N
SCALE IN MILES
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
ESCAMBIA RIVER STUDY
MARCH, 1972
SURVEILLANCE AND ANALYSIS DIVISION
ATHENS GEORGIA

STUDY METHODS

The investigation of significant wastewater sources in the Escambia-Pensacola Bay drainage basin consisted of a review of the types of industries in the study area, a review of waste discharge permits on file with the Florida Department of Pollution Control and an on-site investigation of each major potential pollution source. Eight pollution sources discharging directly into Escambia-Pensacola Bay receiving waters were sampled for a 24-hour period. A single grab sample was collected at the Boise Cascade Corporation plant. Sampling was conducted to characterize and quantify wastewater discharges. Analyses varied with the types of wastewaters sampled but generally included total alkalinity, total acidity, five-day Biochemical Oxygen Demand (BOD_5), Chemical Oxygen Demand (COD), Total Organic Carbon (TOC), total phosphorus, solids series, and nitrogen series. Heavy metal analyses, including chromium, copper, manganese, and zinc, were run on samples collected from facilities treating significant quantities of industrial wastewater.

WASTEWATER SOURCES

General Discussion

From the 1971-72 Directory of Florida Industries, a list of "wet" (Table I) and "dry" industries (Table II) in the Pensacola area has been compiled. Table I also shows the fate of wastewater generated at these facilities. A review of the Florida Department of Pollution Control files showed that (excluding Monsanto, American Cyanamid and Air Products) two industries, nine municipalities, and three Federal facilities are discharging directly into surface waters of the Escambia-Pensacola Bay basin

TABLE I
STUDY AREA INDUSTRIAL WASTE SOURCES
ESCAMBIA-PENSACOLA BAY BASIN
MAY 1972

WASTE SOURCE	TREATMENT	RECEIVING WATERS
Agrico Chemical Company - Pensacola	Lime treatment, settling pond - overflow to Main Street WTP	Pensacola Bay
Air Products & Chemicals, Inc.* - Pensacola	Process wastes - ponds, settling; biological Domestic wastes - septic tanks	Escambia Bay
American Creosote Co. - Pensacola	Ponds - evaporation and percolation	None
American Cyanamid Co. - Pensacola*	Ponds - two parallel settling	Escambia Bay
Armstrong Cork Company - Pensacola	Pensacola Main Street WTP	Pensacola Bay
Ashland Chemical Co. - Pensacola	Pensacola Main Street WTP	Pensacola Bay
Beesley Packing Company of Florida, Inc. - Pensacola	Process water - Main Street WTP	Pensacola Bay
Boise Cascade Corporation - Cantonment	Process wastes - holding tanks for septic tank drainage. Surface drainage - no treatment	Escambia River
Borden Company - Pensacola	Process water - Main Street WTP	Pensacola Bay
Container Corp. of America - Brewton, Ala.*	Ponds - aeration and oxidation	Conecuh River
Escambia Treating Co. - Pensacola	Pond - evaporation with overflow to Pensacola Main Street WTP	Pensacola Bay
Florida Sausage Co., Inc. - Pensacola	Process water - Main Street WTP	Pensacola Bay
Gulf Coast Plating, Inc. - Pensacola	Process water - Main Street WTP	Pensacola Bay
Gulf Power Company - Pensacola	Ponds - settling (flyash) with recycling	Escambia River
Keego Catfish Company - Brewton, Ala.	Process water to septic tanks. Heads, guts, etc. - bury	---
Monsanto Chemical Corp. - Pensacola*	Concentrated process wastes -deep well injection. Dilute process wastes - source control. Sanitary wastes - secondary treatment with chlorination	Escambia River
Pensacola Dairy Company - Pensacola**	---	---
Pepsi Cola Bottling Co. of Pensacola, Inc. - Pensacola	Washwater - Main Street WTP	Pensacola Bay
Tenneco Chemicals, Inc. - Pensacola	Pensacola Main Street WTP	Pensacola Bay
Westinghouse Corporation - Pensacola	Pensacola Northeast WTP	Escambia Bay

* Separate EPA Reports (2, 3, 4, 5)

** Unable to contact - phone disconnected

TABLE II
STUDY AREA INDUSTRIES - NO DISCHARGE
ESCAMBIA-PENSACOLA BAY BASIN

Pensacola, Florida

Aeolian Print Shop
American Optical Company
B&N Truss Company
Barrios & Acosta, Inc.
Barth Lumber Company
Bell Steel Company
Bickerstaff Clay Products Co., Inc.
Boysen Sheet Metal Company
Brownsville Welding Shop
Butler & Son Print Shop
Carter's Sheet Metal Works
Concrete Supply Co.
Cracker Barrel Backery
Crystal Ice Company
Cudahy Company
Cut & Sew Corp. of America
Davis Building Supply Co., Inc.
Dixie Grading & Paving Co.
Escambia Machine & Tool Works
Escambia Molded Products Co.
Escambia Sun Press
Felts' Trailer & Equipment Co., Inc.
Florida Drum Co., Inc.
Gulf Window Co., Inc.
Harris Concrete Products Co., Inc.
Hinote, M. F. & Son
Holley Craft
Industrial Cleaner Mfg. Co., Inc.
Joe's Woodworking Company
Joiner Frozen Foods
Kaiser Agricultural Chemicals
Kerr-McGee Chemical Corp.
Krispy Kreme Doughnut Company
Mayes Printing Co., Inc.
Melanie Bake Shop
Merritt Marine & Marine Supplies
Metal Craft Iron Works
Mr. Concrete, Inc.
Nehi Bottling Co.
Nelson Woodworking Company
New South Press, The
Nichols & Cabinet Co.
NuTek,
Owsley Lumber Co.
Peake Machine Co.
Pensacola Brickcrete & Block Co.
Pensacola Builders' Supply Co., Inc.
Pensacola Engraving Company & Southern Publishing Co.

Pensacola, Florida

Pensacola Marble & Granite Co.
Pensacola News-Journal Company
Pensacola Sash and Door Company
Pensacola Scrap Processors, Inc.
Pensacola Tool & Supply Company
Pfeiffer Printing Co., Inc.
Pioneer Woodworking Company
Plastic Arts Sign Company
Polar Ice Creame & Creamery Co.
Print Quic, Inc.
Reed Printing Company
Runyan Machine & Boiler Works, Inc.
SFK Steel & Supply Co., Inc.
St. Regis Paper Company, Folding Carton Div.
Santa Rosa Lumber Co., Inc.
Sepco Corporation
Seven Up Bottling Company of West Florida, Inc.
Sikes Pipe Company, Inc.
Smith's Bakery, Inc.
Southern Prestressed Concrete, Inc.
Thomson's Print Shop
WBOP Radio Station
WBSR, Inc.
WCOA Radio, Inc.
WEAR-TV Station
WMEL Radio Station
WNVY Radio Station
WPFA Radio Station
Weis-Fricker Mahogany Company
Westinghouse Electric Corporation
Wolfe's, Doug, Cabinet Shop

Brewton, Alabama

Beco, Inc.
Brewton Fashions, Inc.
Brewton Iron Works, Inc.
Brewton Standard, The
Brewton Weaving Company, Inc.
Chavers Distributing Company
Criswell Machine Shop
Dixie Escambia Concrete Co., Inc.
Harold Brothers Lumber Company
Keego Clay Products Co., Inc.
Pettis, C. M., Pole Contractor
Sherrer Machine Works
Stinson's, R. G., Feed Mill

within the State of Florida. One industry and two municipalities discharge into the study area portion of the basin in Alabama. Table I contains a list of industrial pollution sources and Table III lists the municipal and Federal pollution sources discharging into receiving waters in the study area.

On-site investigations were made at six municipal waste treatment facilities, seven industries, and two Federal installations. Wastewater samples were collected from wastewater treatment facilities serving Pensacola (Main Street and Northeast plants), Milton, Pen Haven, Moreno Courts, Warrington, U. S. Naval Air Station, Corry Field (U. S. Navy), and Boise Cascade Corporation. Wastewater from Armstrong Cork Company, Tenneco Chemicals, Inc., and Ashland Chemical Company formerly discharged directly into Bayou Chico. Although wastewater from these plants is presently routed into the Pensacola Main Street Wastewater Treatment Plant, an inspection was made of the plant sites. Three wood preserving companies (American Creosote Works, Inc., Escambia Treating Company, and T. R. Miller Company, Inc.) were visited, but they did not have direct continuous discharges into receiving waters and sampling was not conducted.

Municipal Wastewater Treatment Plants

Pensacola Main Street Wastewater Treatment Plant

The Pensacola Main Street Wastewater Treatment Plant, located at the intersection of Main and Devillier Streets, serves the majority of the area within the Pensacola city limits (Figure 1). The treatment plant (activated sludge) is designed for a flow of 9 million gallons per day (mgd) and a BOD_5 population equivalent of 120,000. The treatment plant

TABLE III
STUDY AREA MUNICIPAL AND FEDERAL WASTE SOURCES
ESCAMBIA-PENSACOLA BAY BASIN
MAY 1972

WASTE SOURCE	TREATMENT	RECEIVING WATERS
Municipalities:		
Brewton, Alabama	Waste stabilization pond	Murder Creek
East Brewton, Alabama	None	Murder Creek
Century, Florida	Waste stabilization pond	Swamp to Escambia River
Jay, Florida	Contact stabilization	Bray Mill Creek to Escambia River
Scenic Hills Country Club Estates	Extended aeration	Bayou to Escambia River
Pensacola Northeast Waste-Wastewater Treatment Plant	Secondary (trickling filter)	Escambia Bay
Pensacola Main Street Waste-water Treatment Plant	Secondary (activated sludge)	Pensacola Bay
Moreno Courts Sub-Division Wastewater Treatment Plant	Secondary (aeration)	Bayou Chico via Jones Swamp Creek
Warrington (West Florida Utilities)	Secondary (aeration)	Bayou Chico via Jones Swamp Creek
Pen Haven Sanitation Company	Secondary (trickling filter)	Bayou Chico via Jackson Branch
Milton, Florida	Secondary (trickling filter)	Blackwater River
Federal Installations:		
U. S. Naval Air Station	Secondary - Biological	Pensacola Bay
Corry Field (U. S. Navy)	Secondary-Primary Sedimentation, standard rate trickling filter, final clarifier, chlorination	Bayou Chico
Ellyson Field (U. S. Navy)	Northeast wastewater Treatment Plant	Escambia Bay
Whiting Field (U. S. Navy)	Domestic - low rate trickling filter; Industrial - no treatment	East Bay via Clear Creek, Blackwater Bay

presently serves an estimated population of 56,000 and numerous industries. Flow into the plant averages about 7 mgd. Operating reports show treatment efficiencies for BOD_5 and nonfilterable residue (suspended solids) average about 90 and 80 percent, respectively. A single 24-hour composite sample, using a Protech automatic sampler, was collected at the final clarifier discharge. Analytical results (Tables IV-V) show the plant to be a significant contributor of pollution to Pensacola Bay. Organic discharges were: BOD_5 - 1,800 lbs/day, COD - 7,500 lbs/day, and total organic carbon - 2,000 lbs/day. The discharge also contained significant quantities of total solids - 19,700 lbs/day, dissolved solids - 17,000 lbs/day, suspended solids - 2,900 lbs/day were also discharged. Effluent is discharged into Pensacola Bay through a 40-inch diameter submerged outfall line which extends 2,800 feet into the bay.

Basic treatment units at the plant consist of pre-aeration and grit removal, primary clarifiers, aeration basin, secondary clarifiers, and digesters (Figure 2). In addition to the units shown in Figure 2, there are return sludge pumps for recirculating sludge from secondary clarifiers to aeration tanks and waste sludge pumps for transferring waste activated sludge to primary clarifiers for thickening and subsequent transfer to the digesters. Digested sludge is disposed of at a land fill located adjacent to Elevenmile Creek (Perdido Bay drainage basin). Aeration tanks, designed for either contact stabilization or step aeration, are being used in the step feed-step aeration process.

City officials estimated that between 2 and 3 mgd of the 7 mgd of wastewater treated at the Main Street plant are from industrial sources.

TABLE IV

WASTE TREATMENT PLANTS
MARCH 7-12, 1972

AVERAGE ANALYTICAL WASTE DATA

STATION	DATE	TIME	DATE	TIME	LAB PH SU	T-ACDITY CACO3 MG/L	T-ALK CACO3 MG/L	BOD 5-DAY MG/L	COD H-LEV MG/L	TOC C MG/L	PHOS-T P-WET MG/L	RESDUE V-NFLT MG/L	RESDUE T-NFLT MG/L	RESDUE TOTAL MG/L	RESDUE T-VOL MG/L	T-KJEL N MG/L
STP-1	720310	1345(C)	720311	1245	6.7	32	108	50	95	22	9.40	--	11	235	--	17.5
STP-2	720310	1400(C)	720311	1400	6.8	19	73	27K	41	14	7.60	--	18	177	--	11.8
STP-3	720310	1700(C)	720311	1500	7.1	6	58	9	65	20	12.20	--	28	307	--	4.4
STP-4	720313	0930(C)	720314	0900	6.4	19	29	43	243	53	11.40	--	82	332	--	12.0
STP-5	720309	0845(C)	720310	0745	6.9	40	149	80	259	60	12.70	18	30	292	107	28.5
STP-6	720309	1815(C)	720310	1630	6.7	20	66	31	131	35	11.00	32	50	342	86	7.7
STP-7	720313	1400(C)	720314	1400	8.2	0	54	32	75	29	1.89	10	24	343	43	6.1
STP-8	720310	0830(C)	720311	0830	6.6	31	84	48	221	51	9.40	--	26	243	--	17.5

STATION	DATE	TIME	DATE	TIME	AMONIA NH3-N MG/L	NO2NO3 N MG/L	RESDUE DIS-105 C MG/L	RESDUE VOL FLT MG/L	CHROMN CR TOT UG/L	COBALT CO TOT UG/L	COPPER CU-TOT UG/L	MANGSE MN UG/L	TITANM TI-TOT UG/L	VANADM V TOT UG/L	ZINC ZN TOT UG/L	FLOW MGD
STP-1	720310	1345(C)	720311	1245	15.0	15	224	--	--	--	--	--	--	--	--	.848
STP-2	720310	1400(C)	720311	1400	10.0	15	159	--	--	--	--	--	--	--	--	.125
STP-3	720310	1700(C)	720311	1500	1.6	15	279	--	--	--	--	--	--	--	--	.158
STP-4	720313	0930(C)	720314	0900	10.0	35	250	--	--	--	--	--	--	--	--	.175
STP-5	720309	0845(C)	720310	0745	20.0	15	262	89	50K	100K	100	50	500K	500K	450	.526
STP-6	720309	1815(C)	720310	1630	3.3	35	292	54	70	100K	50	70	500K	500K	780	6.900
STP-7	720313	1400(C)	720314	1400	3.4	15	319	33	100	100K	50K	50	500K	500K	60	1.580
STP-8	720310	0830(C)	720311	0830	13.0	10	217	--	--	---	--	--	--	--	--	.990

STATION	DATE	TIME	PH SU	OIL GNSE-T MG/L	PHENOL UG/L	CYNIDE CN MG/L
STP-5	720310	0745	7.1	7.8	--	--
STP-6	720310	0930	6.9	3.0	17	.01
STP-7	720314	0930	--	11.1	17	.02

NOTE: K = Less Than

TABLE V
WASTE TREATMENT PLANTS
MARCH 7-12, 1972

AVERAGE LOAD WASTE DATA

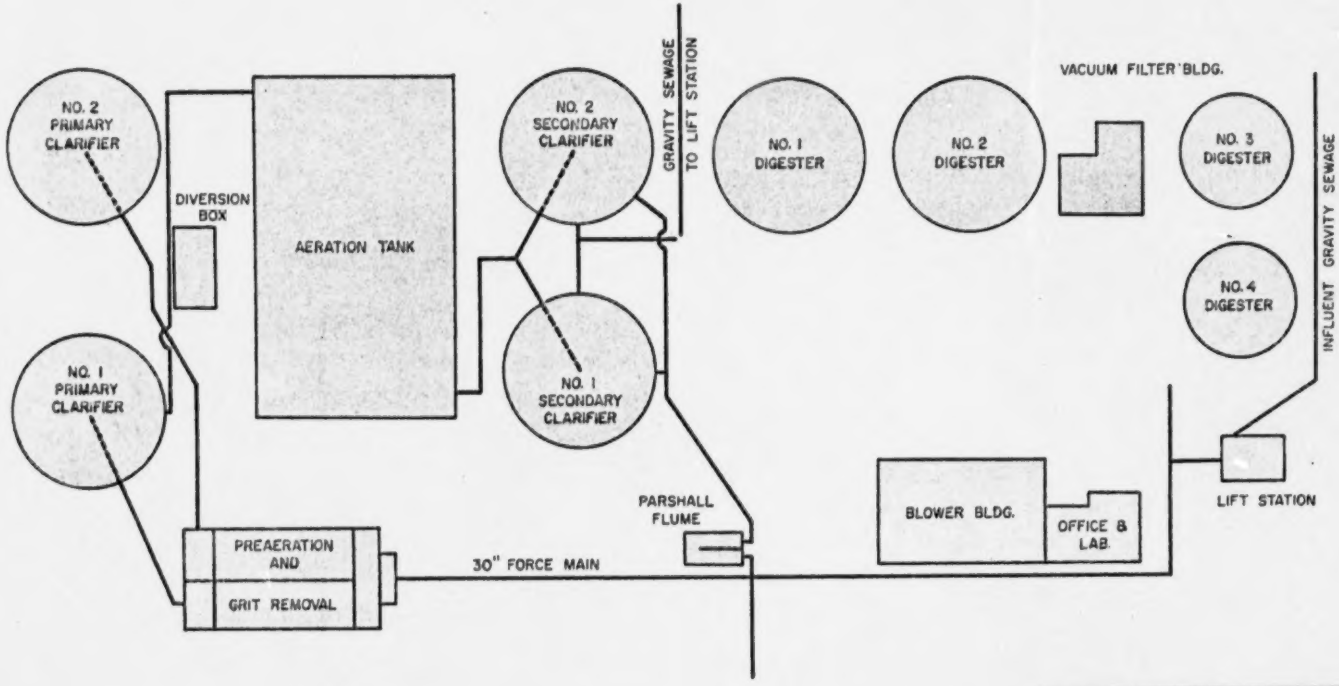
STATION	FLOW MGD	T-ACIDITY CACO3 LB/D	T-ALK CACO3 LB/D	BOD 5-DAY LB/D	COD H-LEV LB/D	TOC C LB/D	PHOS-T P-WET LB/D	RESDUE V-NFLT LB/D	RESDUE T-NFLT LB/D	RESDUE TOTAL LB/D	RESDUE T-VOL LB/D	T-KJEL N LB/D	AMONIA NH3-N LB/D	NO2NO3 N LB/D	RESDUE DIS-105 C LB/D
STP-1	0.848	226	764	353.8	672	155.7	66.5	--	78	1663	--	123.8	106.2	106.2	1585
STP-2	0.125	20	76	--	43	14.6	7.9	--	19	185	--	12.3	10.4	15.7	166
STP-3	0.158	8	76	11.9	86	26.4	16.1	--	37	405	--	5.8	2.1	19.8	368
STP-4	0.175	28	42	62.8	355	77.4	16.7	--	120	485	--	17.5	14.6	51.1	365
STP-5	0.526	176	654	351.2	1137	263.4	55.8	79	132	1282	470	125.1	87.8	65.8	1150
STP-6	6.900	1152	3800	1785.0	7543	2015.3	633.4	1843	2879	19692	4952	443.4	190.0	2015.3	16813
STP-7	1.580	0	712	421.9	989	382.4	24.9	132	316	4522	567	80.4	44.8	197.8	4206
STP-8	0.990	256	694	396.5	1826	421.3	77.7	--	215	2008	--	144.6	107.4	82.6	1793

STATION	RESDUE VOL FLT LB/D	CHROMN CR TOT LB/D	COPPER CU TOT LB/D	MANGSE MN LB/D	ZINC ZN TOT LB/D
STP-1	--	-	-	--	--
STP-2	--	-	-	--	--
STP-3	--	-	-	--	--
STP-4	--	-	-	--	--
STP-5	391	-	0	0.2	2
STP-6	3109	4	3	4.0	45
STP-7	435	1	-	0.7	1
STP-8	--	-	-	--	--

STP-1 PEN HAVEN SUBDIVISIONS'S STP
STP-2 MAHENO COURTS SUBDIVISION'S STP
STP-3 WARRINGTON'S STP
STP-4 CORRY FIELD'S(U.S.NAVY) STP
STP-5 PENSACOLA'S NORTHEAST STP
STP-6 PENSACOLA'S MAIN STP
STP-7 NAVY AIR STATION'S STP
STP-8 MILTON, FLORIDA'S STP
BCC-1 BOISE CASCADE CORP. STP

FIGURE 2

PENSACOLA
MAIN WASTEWATER TREATMENT PLANT



U.S ENVIRONMENTAL PROTECTION AGENCY
REGION IV

ESCAMBIA BAY STUDY
MARCH, 1972

SURVEILLANCE AND ANALYSIS DIVISION
ATHENS GEORGIA

Three large industries (Ashland Chemical Company, Armstrong Cork Company, and Tenneco Chemicals, Inc.) have recently connected to the portion of the city sewer system served by the Main Street treatment plant. Waste contributions from these industries are:

Parameter	Ashland	Armstrong	Tenneco
Flow (mgd)	0.2	0.3	0.6
BOD_5 (lbs/day)	310	2,570	3,860
Residue, Nonfilterable (lbs/day)	128	1,628	357

The addition of these industrial wastewaters has caused the Main Street treatment plant to approach its design capacity; however, monthly reports submitted to the Florida Department of Pollution Control indicate the additional industrial wastewaters are being treated without having a detrimental effect on treatment processes or efficiencies.

Pensacola Northeast Wastewater Treatment Plant

The Northeast Wastewater Treatment Plant, owned by the City of Pensacola, is located near the intersection of U. S. Highway 90 East (Scenic Highway) and Langley Avenue. The plant provides secondary treatment (primary clarification, high-rate trickling filter, final clarification, chlorination, sludge digesters) for a design capacity of 0.85 mgd and biological population equivalent of 8,500 people. The wastes are primarily of domestic origin with some industrial wastes from Ellyson Field - U. S. Navy (oil and grease) and Westinghouse Corporation (manufacturers of internal components for nuclear reactors). Flow during the study was 0.5 MGD. The effluent is

discharged into Escambia Bay through a 1,500-foot submerged outfall line.

A treatment efficiency study was not conducted by EPA; however, there appeared to be no operational problems. Monthly operating reports submitted to the Florida Department of Pollution Control indicated BOD_5 removal ranged from 60 to 90 percent and the suspended solids removal averaged about 65 percent.

One 24-hour composite sample using a Serco automatic sampler was collected at the final clarifier discharge. The accumulative effect of the effluent from this plant and other treatment plants discharging into Escambia River and Bay is detrimental to the bay, especially due to the existing stressed conditions (6). The Northeast Treatment plant effluent characteristics are presented in Tables IV and V.

The City of Pensacola is considering abandoning this plant and pumping the wastes to the Main Street plant. If the plant is not abandoned, it should be expanded to include advanced waste treatment.

Milton, Florida

The Milton wastewater treatment plant, located on East Walker Street, provides secondary treatment (primary clarification, high-rate trickling filters, secondary clarification, chlorine contact chamber, sludge digesters - sludge to landfill) for the wastes from 9,000 people. The wastewater flow of 1 mgd is conveyed through an 18-inch diameter pipe into Blackwater River, a tributary to Blackwater Bay. The point of discharge is below the water surface.

The design capacity of the plant is 1.8 mgd. A septic odor was noticed around the plant; however, the origin of the odor was unknown. Although a treatment efficiency study was not conducted by EPA, monthly operating reports submitted to the Florida Department of Pollution Control show BOD_5 and suspended solids removals to be 67 and 77 percent, respectively.

A single 24-hour composite sample using a Serco automatic sampler was collected at the chlorination chamber discharge. Waste characteristics are enumerated in Tables IV and V and are within an acceptable range for a trickling filter waste treatment plant.

Pen Haven

The Pen Haven wastewater treatment plant is owned by the West Florida Utilities Company. The facility is located at the intersection of Francis and Kinnear Streets. It provides secondary treatment (primary clarification, standard rate trickling filter, secondary clarification, chlorine contact, sludge digestion) for the domestic wastes from 5,300 people with a wastewater flow of 850,000 gallons per day. The treatment plant effluent is discharged into a drainage ditch which flows into Bayou Chico via Jackson Branch.

The plant's design capacity is 0.3 mgd. Although flow did exceed the hydraulic design capacity, the plant did not appear to be overloaded and the analytical data did not reflect either high dilution or unusually high pollutant concentrations. The flow totalizer may be inaccurate and recording erronous flows.

A treatment efficiency study was not conducted by EPA; however, monthly operating reports submitted to the Florida Department of Pollution Control

indicate BOD_5 removals greater than 90 percent and suspended solids removals of approximately 80 percent. The only operational problem observed was with the trickling filter which had to be flooded once each week to eliminate filter flies.

A single 24-hour composite sample using a Serco automatic sampler was collected at the final clarifier discharge. Based on the measured flow of 848,000 gallons per day, the pollutional loads discharged (Table V) would be detrimental to local water quality in Pensacola Bay. Although water quality in the drainage ditch and Jackson Branch was not monitored, severe water quality degradation probably occurs in these tributaries to Bayou Chico. During dry weather, this discharge probably accounts for most of the flow in Jackson Branch.

Moreno Courts

The Moreno Courts waste treatment plant is owned by the Pensacola Housing Authority and is located on the south side of Jones Swamp Creek adjacent to Old Corry Field Road. The plant provides secondary treatment (primary clarifier, aeration chamber and secondary clarifier combined, polishing pond, chlorine contact pond, sludge drying beds) for the domestic waste from approximately 2,300 people. The wastewater flow is 125,000 gallons per day and discharged into Bayou Chico via Jones Swamp Creek.

The hydraulic design capacity is 0.21 mgd. There appeared to be no operating problems. Treatment efficiency studies were not conducted by EPA, but monthly operating reports submitted to the Florida Department of Pollution Control indicate BOD_5 and suspended solids removals of approximately 88 and 60 percent, respectively.

A single 24-hour composite sample using a Serco automatic sampler was collected at the polishing pond effluent (prior to chlorination). The concentrations of the constituents discharged (Table IV) are reasonable for this size and type plant. The plant's discharge is minor (Table V), but the accumulative effect of this discharge plus discharges from Warrington and Corry Field, probably cause water quality degradation in Jones Swamp Creek.

Warrington

The Warrington waste treatment plant is owned by West Florida Utilities. The facility is located adjacent to Old Corry Field Road on the north side of Jones Swamp Creek. It provides secondary treatment (extended aeration, clarification, polishing pond, chlorination pond) for the domestic wastes from 1,600 people. The wastewater flow is 160,000 gpd; discharge is into Bayou Chico via Jones Swamp Creek.

The hydraulic design capacity is 0.17 mgd. There appeared to be no operating problems; however, copper sulfate was used for algae control in the polishing pond. Treatment efficiency studies were not conducted by EPA, but monthly reports submitted to the Florida Department of Pollution Control indicate that the BOD_5 and suspended solids removals are approximately 90 percent.

One 24-hour composite sample, using a Protech automatic sampler, was collected at the chlorination pond discharge. The constituents discharged (Table IV) are in the range of concentrations expected from an extended aeration waste treatment plant. Although the waste load (Table V) from this facility is small, the discharge is probably contributing to water quality degradation in Jones Swamp Creek.

Industrial Sources

Newport Division, Tenneco Chemicals, Inc.

Tenneco Chemicals produces Naval Stores products (wood resins, turpentine, pine oil, and other terpene fractions naturally occurring in pine stumps) using the solvent extraction process. Raw materials include pine stumps and a special blend of naptha-toluene extraction solvents. The wastewater (approximately 1.6 mgd) is pretreated with ferrous sulphate and lime and pumped to the Main Street Treatment Plant. The surface runoff is collected in a drainage ditch which flows into an API separator where oil and grease are manually removed. Runoff is then pumped to the central pump station which pumps to the Main Street Treatment Plant. During periods of heavy rainfall, runoff may bypass the pumps and flow into the upper end of Bayou Chico.

Armstrong Cork Company

The Armstrong Cork Company plant produces fire resistant accoustical ceiling tile from mineral wool, clay, and other ingredients. Wastes from the manufacturing process are treated at the company's primary treatment facility. Solids removed in the primary clarifier are recycled for recovery and reuse of valuable waste constituents. Treated wastewater flows from the primary clarifier over a screen into a collection tank for reuse in the process. Excess water (0.23 mgd) is transported to the final clarifier and then to the Pensacola Main Street Wastewater Treatment Plant. A secondary collection system conveys storm runoff from plant buildings and grounds and the clear sealing water from a vacuum pump to the central pump station of the Main Street treatment plant collection system.

Domestic wastes are also pumped to the Pensacola treatment system.

Ashland Chemical Company, Division of Ashland Oil & Refining Company

The Ashland Chemical Company produces synthetic resins from petrochemicals. The wastes generated within various manufacturing operations are segregated and treated by appropriate means (oil separator, settling ponds, and aeration). The pretreated wastewater (0.15 mgd) is pumped to Pensacola's Main Street Wastewater Treatment Plant. Domestic wastes also flow into the city sewer system.

Boise Cascade Corporation

Boise Cascade, Cantonment, Florida, manufactures interior and exterior plywood from longleaf pine logs. The manufacturing process consists of the following operations:

- Logs are debarked, veneered, and wood laminates are prepared for sheet formation.
- Laminated wood is glued, pressed, trimmed, sanded, and packaged.

Interior glues contain dried blood, soya flour, lime, caustic soda, and sodium silicate. Formaldehyde and pentachlorophenol may be added to produce glue which is toxic to insects. Exterior glues contain a furfural extraction of corncobs and oat hulls, wheat flour, phenolic formaldehyde resin, and caustic soda ash (1).

The only wastes are from washing glue spreaders and flow to two underground concrete holding tanks which are cleaned periodically by a septic tank cleaning service. Steam condensate water and surface drainage

discharge into a ditch and eventually flow into the Escambia River.

A single grab sample was collected for solids analyses from the ditch 10 feet downstream from the junction of the wastewater streams from the boiler and production room (Figure 3). Although surface water flowed through the wood yard, the following concentrations do not reveal excessive loss of solids:

Total volatile solids	382 mg/l
Total dissolved solids	452 mg/l
Dissolved volatile solids	200 mg/l
Total suspended solids	248 mg/l
Volatile suspended solids	182 mg/l

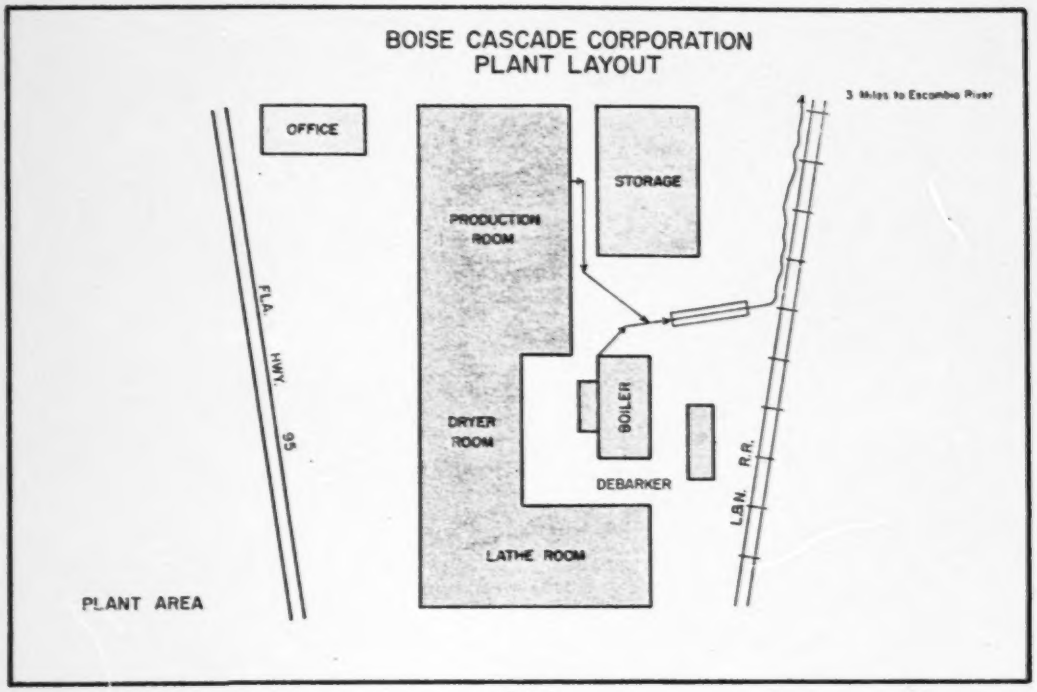
American Creosote Works, Inc.

The American Creosote Works plant is located southeast of Barrancas Avenue and east of "L" Street in Pensacola. Operation at the plant includes log preparation and treatment. Logs are debarked, treated with an anti-fungicide (penta-chlorophenate), separated by size and length, stacked and framed, and placed in a treatment chamber for treatment with either creosote or pentachlorophenol.

Treatment of logs consists of:

- Steam treating to evaporate water in the wood cells, followed by vacuum removal of water within the logs;
- Adding air under pressure for a short time and then adding either creosote or pentachlorophenol for a specific length of time depending on log thickness, and
- Draining additives and applying a vacuum to remove excess additives from within the logs.

FIGURE 3



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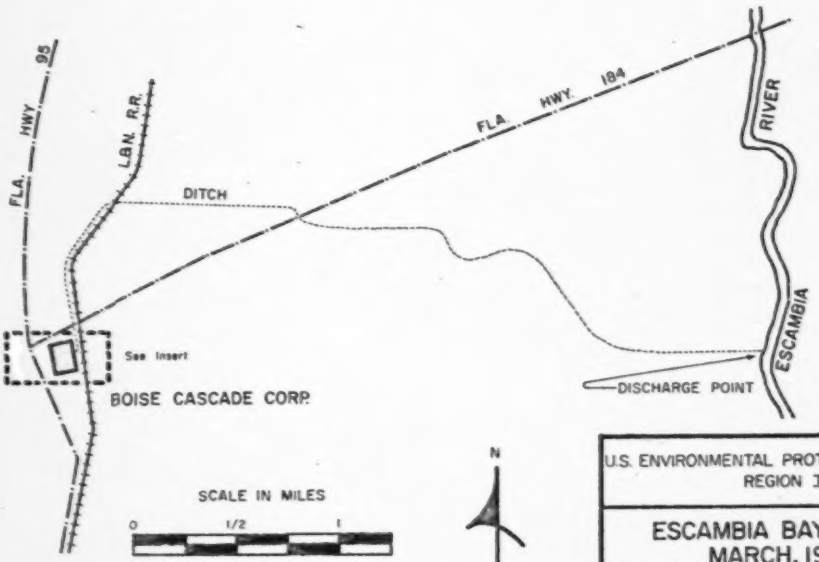

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REGION IV

ESCAMBIA BAY STUDY
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ATHENS GEORGIA

Process wastes and steam condensate containing wood impurities and additives are discharged to pits where oil is skimmed and creosote settles. Wastewater flows to evaporation ponds which are also cooling ponds for barometric condensers. There was no discharge from the ponds during the investigation. During intense rainfalls of prolonged duration, the ponds could possibly overflow. During normal periods of operation, the dikes should be capable of containing spillage and the sandy soil would absorb the water. The company plans to dry the existing ponds and replace them with concrete ponds. Surface drainage flows into the sandy soil and domestic wastes flow to the city sewer system.

T. R. Miller Company, Inc.

Wood treating operations at the T. R. Miller Company facilities, located in Brewton, Alabama, consists of log preparation and treatment. Logs are debarked (bark and wood chips are burned in the boiler operation), cut to specific lengths, and kiln dried prior to preservative treating.

Poles, posts, piles, and lumber are treated with creosote, pentachlorophenol, and water-borne preservatives to prevent decay and protect against insects. The process includes steam and vacuum conditioning, preservative impregnation, and final vacuum for cleanliness and excess preservative recovery.

Wastewater from the preservative operation is piped to a blowdown tank for transfer to the No. 1 settling pool. Overflow from the No. 1 pool flows to the No. 2 pool and finally to an evaporation-percolation pond. Steam condensate, from cylinder coils, and pumps, drains into a condensed steam pool which discharges into a ditch that drains to the

pond overflow ditch. Sanitary wastes are treated in septic tanks.

Excessive rainfall could cause the evaporation-percolation pond to overflow into a ditch which drains to Murder Creek, a tributary of the Conecuh River.

Escambia Treating Company

Plant operations of the Escambia Treating Company, located in the north central portion of Pensacola, consists of log preparation and treatment. Logs are debarked, treated with an anti-fungicide, separated by size and length, stacked and framed, and placed in a treatment chamber for treatment with pentachlorophenol. Escambia Treating Company uses a log treatment process similar to that employed by American Creosote.

Contaminated water and additives are discharged into an oil separator. The recovered oil is passed through a filter press where impurities are removed and the oil is recycled into the process. Wastewater and impurities flow into the evaporation pond. All pond overflow discharges into the city sewer system along with the company's domestic wastes.

Federal Facilities

U. S. Naval Air Station

The primary mission of the Naval Air Station (NAS) is to overhaul and rework aircraft, including air frames and aircraft engines. Work on the airframe includes paint stripping, oil and grease removal, corrosion removal, and repainting. Engine overhaul includes degreasing, washing, rinsing, plating, X-raying, rebuilding, and testing. The base population of approximately 16,755 includes naval personnel, dependents and civilians.

The wastewater treatment plant, located on Magazine Point at the east end of the installation (Figure 1), provides the equivalent of secondary treatment (Figure 4) for all domestic and industrial wastes from the station. This system includes the old primary plant, which treated the domestic wastes prior to construction of the present 3.0 mgd combined treatment plant. The wastewater flow is about two-thirds domestic and one-third industrial with a total BOD_5 population equivalent of 12,600. The Navy plans to increase the old primary portion of the wastewater treatment plant to 2.5 mgd. The effluent from the cyanide treatment system, located in building 755, is discharged to the sanitary sewer system. Before the existing waste treatment plant began operation, several waste streams (with and without treatment) discharged from various locations around the station into Pensacola Bay.

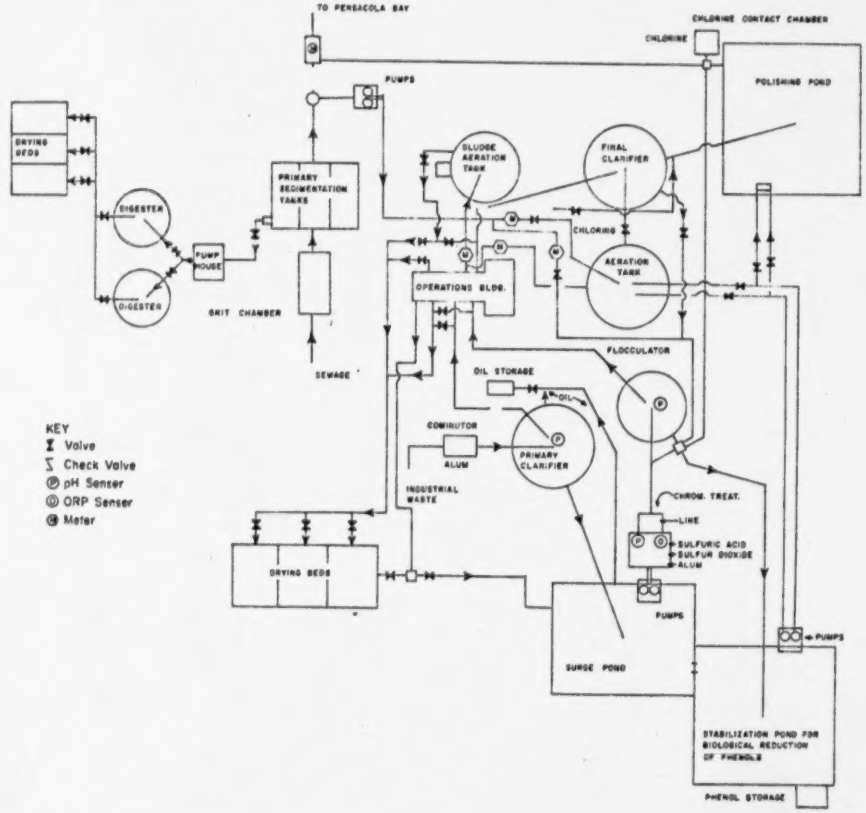
During the sample period (March 13-14, 1972), the flow recorder (shunt-type) was reputed to be operating correctly, and a flow of 1.58 mgd was recorded. Naval Air Station personnel estimated the flow to be approximately 2.5 mgd; however, the flow meter was assumed correct for calculating waste loads. The effluent is discharged into Pensacola Bay through a submerged outfall line, 24 inches in diameter and 2,400 feet in length.

There appeared to be no operational problems, and there was no odor. Ducks lived near the polishing pond, and the water from the pond was continuously pumped through an inhabited fish tank.

Treatment efficiency studies were not conducted by EPA, but NAS personnel state that the BOD_5 removal approaches 92 percent, TOC and COD removals 90 percent, and suspended solids removal 80 percent.

FIGURE 4

PENSACOLA NAVAL AIR STATION
WASTEWATER TREATMENT FACILITIES



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A single 24-hour composite sample, using a Protech automatic sampler, was collected at the polishing pond discharge (prior to chlorination). Although the organic load is not extremely high (42 lbs/day - BOD_5, 988 lbs/day - COD, 382 lbs/day - organic carbon, 146 lbs/day - oil and grease), it does constitute a notable load to Pensacola Bay (Table V). Metal analyses showed that the discharge into Pensacola Bay contained 1.3 lbs/day of total chromium, 0.7 lbs/day of manganese, and 0.7 lbs/day of zinc. The daily discharges also contained 0.2 lbs of phenols and 0.3 lbs of cyanide. The metal, phenol, and cyanide loadings are relatively small and should not significantly contribute to the concentration of these parameters in Pensacola Bay.

Corry Field (U. S. Navy)

Corry Field is a U. S. Navy communications training center. Wastewater treatment facilities serving the training center are located at the southeast corner of the installation. Treatment facilities (primary clarification, standard rate trickling filter, secondary clarification, chlorine contact tank, digester, sludge drying beds) provide secondary treatment for the domestic wastes from 500 employees. No industrial waste is produced. Wastewater flow is approximately 175,000 gallons per day. Surface discharge is into Bayou Chico via Jones Swamp Creek.

The hydraulic design capacity of the plant is 0.21 mgd. Although there appeared to be no operating problems, the 350 gallons per capita per day wastewater flow recorded indicates the presence of an unreported discharge or extremely high infiltration occurred. Completion of a new housing facility and hospital will cause increased loadings which will

exceed the capacity of the existing treatment facility. A proposal to pump waste from Corry Field to the Pensacola sewer system has been considered, but plans have not been finalized yet.

Treatment efficiency studies were not conducted by EPA, but Navy personnel state that BOD_5 removal approaches 95 percent, TOC about 85 percent, COD about 92 percent, and suspended solids approximately 80 percent. One 24-hour composite sample using a Serco automatic sampler was collected at the final clarifier discharge. The concentration and loads of the constituents discharged are presented in Tables IV and V, respectively.

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5. EPA, Surveillance and Analysis Division, Region IV, Atlanta, Georgia. "Container Corporation of America - Brewton Mill", November 1971.

6. U. S. Department of the Interior, FWPCA. "Effects of Pollution on Water Quality - Escambia River and Bay, Florida", January 1970.

APPENDIX A

PROJECT PERSONNEL

Tom Bennett - Chemist

Jerry Burger - Engineering Aid

Steve Hall - Sanitary Engineer

Wiley Johnson - Chemical Technician

Pat Lawless - Chemist

APPENDIX B

CHEMICAL ANALYTICAL METHODS

Water and Wastewater

PARAMETER	METHOD	REFERENCE	MODIFICATION
Acidity	Volumetric, NaOH Titration	1	Potentiometric Endpoint
Alkalinity	" H_2SO_4 Titration	1	" "
Ammonia	Automated Phenolate Method	2	None
Biochemical Oxygen Demand	Winkler D.O., 5-day	1,2	Azide Modification Formula "C" Dilution Water w/Sewage Sed.
Chemical Oxygen Demand	Acid-Dichromate Oxidation	2	None
Chromium, Total	Atomic Absorption	1,2	$HCl-HNO_3$ Digestion
Cobalt	Atomic Absorption	1,2	$HCl-HNO_3$ Digestion
Copper	Atomic Absorption	1,2	$HCl-HNO_3$ Digestion
Dissolved Solids	Difference Between Total and Solids	-	-
Cyanides	Pyridine-Pyrazolone	1,2,3	Distillation Cleanup
Manganese	Atomic Absorption	1,2	$HCl-HNO_3$ Digestion
Nitrate-Nitrite	Copper-Cadmium Reduction, Automated	2	None

PARAMETER	METHOD	REFERENCE	MODIFICATION
Oil and Grease	Solvent Extraction	1	None
pH	Electrometric	1	None
Phenols	4-Aminoantipyrine	1	Distillation, Automated Colorimetric Analysis
Phosphorus	Ascorbic Acid Method	2	Automated, Manual Digestion
Suspended Solids	Gravimetric	1	None
Total Kjeldahl Nitrogen	Automated Phenolate Method	2	None
Total Organic Carbon	Carbon Analyzer	2	None
Total Solids	Gravimetric, 105°C	1	None
Volatile Suspended Solids	Gravimetric, 550°C	1	None
Volatile Total Solids	Gravimetric, 550°C	1	None
Zinc	Atomic Absorption	1,2	$HCl-HNO_3$ Digestion
Titanium	Atomic Absorption	1,2	$HCl-HNO_3$ Digestion
Vanadium	Atomic Absorption	1,2	$HCl-HNO_3$ Digestion

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1. Standard Methods for Examination of Water and Wastewater, 13th Edition, 1971.
2. EPA Manual of Methods for Chemical Analyses of Water and Wastes, 1971.
3. ASTM Book of Standards, Part 23, 1971.